



Federal Aviation Administration

Memorandum

Date: December 6, 2010

To: Manager, Seattle Aircraft Certification Office, ANM-100S

From: Manager, Transport Airplane Directorate, ANM-100

Prepared by: Susan Letcher

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for the Aviation Partners Boeing Winglet-Equipped Model 737-800 Airplane for Forward Position Light Intensity (FAA Project Numbers TD5046SE-T and SA4726SE-T)

ELOS Memo #: TD5046SE-T-SE-1

Reg. Ref.: §§ 21.16, 25.1389(b)(1), 25.1389(b)(2), 25.1391, and 25.1393

The purpose of this memorandum is to inform the certificate management aircraft certification office of an evaluation made by the Transport Airplane Directorate on the establishment of an equivalent level of safety (ELOS) finding for Boeing Model 737-800 airplanes equipped with winglets incorporated in production and incorporated via an Aviation Partners Boeing Supplemental Type Certificate (STC).

Background

Boeing and Aviation Partners Boeing have submitted a joint request for an ELOS finding to Title 14, Code of Federal Regulations (14 CFR) 25.1389(b)(1), 25.1389(b)(2), 25.1391, and 25.1393 for Model 737-800 airplanes modified to install winglets in production and via STC, respectively, on which the forward position light intensity levels fall below minimum required intensity levels in certain dispatch conditions.

The winglet-equipped 737-800 has red and green position lights mounted on the left and right wing tips, respectively, and each of the position light assemblies has two lamps. Sections 25.1389(b)(1) and 25.1389(b)(2) specify that the minimum level of intensity for each position light in the horizontal and vertical planes must meet §§ 25.1391 and 25.1393, respectively, to allow detection of the aircraft at a safe distance and to allow an observing aircraft to detect the relative orientation of the observed aircraft at night. The two-lamp position light design is

intended to meet the minimum intensity requirements with just one of the lamps operational. With both lamps operational, both the red and green position lights meet the minimum intensity requirements of §§ 25.1391 and 25.1393. However, if one of the lamps in either the red or green position light assembly is inoperative, the respective position light will not meet the minimum intensity requirements of §§ 25.1391 and 25.1393 when viewed from small areas at the most aft dihedral angles.

Applicable regulation(s)

§§ 25.1389(b)(1), 25.1389(b)(2), 25.1391, and 25.1393

Regulation(s) requiring an ELOS finding

§§ 25.1389(b)(1), 25.1389(b)(2), 25.1391, and 25.1393

Description of compensating design features or alternative standards which allow the granting of the ELOS (including design changes, limitations or equipment need for equivalency)

The FAA reviewed the winglet-equipped 737-800 position light system design and specific areas where the position light intensity falls below the required minimum intensity levels with one lamp inoperative in either position light, and determined that an ELOS may be granted for §§ 25.1389(b)(1), 25.1389(b)(2), 25.1391, and 25.1393, provided dispatch with one lamp inoperative is limited per the airplane's Master Minimum Equipment List, based on the following:

- The discrepancy exists only at non-critical viewing angles when one lamp is inoperative, and is not present at all when both lamps are operative.
- The discrepancy would only be detectable to an observer for a very short time due to the small affected area of coverage and the non-critical viewing angles at which it can be observed.

Explanation of how design features or alternative standards provide an equivalent level of safety to the level of safety intended by the regulation

The area where the position light intensity falls below the required minimum intensity levels only exists during dispatch with one lamp inoperable in the position light. The area from which the discrepancy can be viewed is limited, non-critical, located at the most extreme dihedral angles, and would only be visible to an observer for a very short period of time. As such, dispatch with one lamp inoperable is acceptable provided this is limited per the airplane's Master Minimum Equipment List.

Note that although this ELOS allows dispatch with one lamp inoperable, a separate ELOS for §§ 25.1389(b)(3) and 25.1395 was approved via FAA Issue Paper SE-2 for this project which prohibits dispatch with one lamp in the red position light inoperable.

FAA approval and documentation of the ELOS finding

The FAA approved the aforementioned ELOS finding in project issue paper SE-1. This memorandum provides standardized documentation of the ELOS finding that is non-proprietary and can be made available to the public. The Transport Directorate has assigned a unique ELOS Memorandum number (see front page) to facilitate archiving and retrieval of this ELOS. This ELOS Memorandum number should be listed in the Type Certificate Data Sheet under the Certification Basis section (TC's & ATC's) or in the Limitations and Conditions Section of the STC Certificate. An example of an appropriate statement is provided below.

Equivalent Level of Safety Findings have been made for the following regulation(s):
 §§ 25.1389(b)(1), 25.1389(b)(2), 25.1391, and 25.1393 (documented in TAD ELOS Memo TD5046SE-T-SE-1)

James J. Bunting for Steve Boyd
 Manager, Transport Airplane Directorate,
 Aircraft Certification Service

12/7/10
 Date

ELOS Originated by Seattle ACO:	Project Engineer Susan Letcher	Routing Symbol ANM-150S
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